

Stroke Unit Trialists' Collaboration. Organized inpatient (stroke unit) care for stroke (Review). Cochrane Database of Systematic Reviews 2007, Issue 4, Art # CD0001097.

Design: Meta-analysis of clinical trials

PICOS:

- **Patient population:** any patient admitted to hospital with clinical definition of stroke: focal neurological deficit due to cerebrovascular disease, exclusive of subarachnoid hemorrhage or subdural hematoma
- **Interventions:** Organized inpatient stroke care, in which service organization is considered as a hierarchy in descending order as follows:
 - o Stroke ward which cares exclusively for stroke patients
 - Acute stroke units which admit patients acutely but usually discharge patients within 7 days
 - “Intensive” model with continuous monitoring with potential for life support
 - “Semi-intensive” with continuous monitoring without potential for life support
 - “Non-intensive care with neither monitoring nor life support
 - Rehabilitation units which accept patients after a delay and focus on rehabilitation
 - Comprehensive (combined acute and rehabilitation) units
 - o Mixed rehabilitation wards, which provide multidisciplinary teams providing rehabilitation services for stroke and non-stroke patients
 - o Mobile multidisciplinary stroke teams providing care in a variety of settings
 - o General medical ward which cares for medical and neurological patients without routine multidisciplinary input
- **Comparison intervention:** any alternative care delivery model which was usually conventional care but which include one of the forms of care under “Interventions”
- **Outcomes:** The primary “bad outcomes” were death, death or institutional care at the end of follow-up, and death or dependency at the end of follow-up
 - o “Institutional care” meant care in a residential home, nursing home, or hospital at the end of follow-up
 - o “Dependency” meant requiring physical assistance for transfers, mobility, dressing, feeding, and toileting
- **Study types:** Prospective trials in which either strict randomization or quasi-randomization (bed availability, date of admission) was used to assign treatment model

Study selection:

- The authors used the “specialized register” section of the Cochrane Stroke Group which was last updated in April 2006; this incorporates data from several databases
- Two authors recorded methodological quality indicators such as allocation concealment, blinding, and completeness of follow-up, but did not use a formal scoring system for quality
 - o 7 trials used allocation methods which were clearly not strictly randomized (based on bed availability or patient date of birth); these were evaluated separately to exclude significant selection bias

Pertinent results:

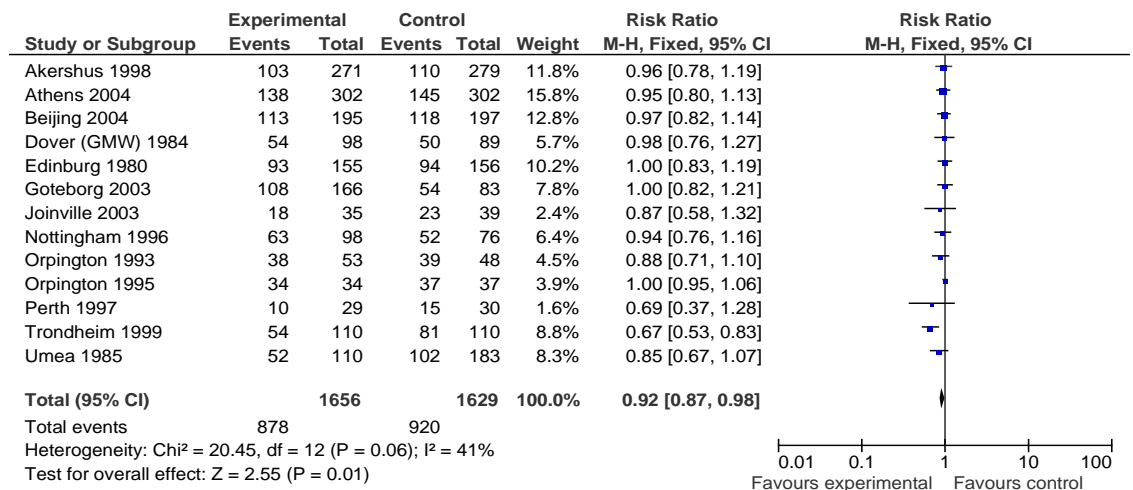
- A total of 31 studies with 6936 patients were identified and included in the analysis
- No studies were found which met the definition of “intensive” inpatient stroke care; the highest level of care organization was for the semi-intensive care model
- In general, the analyses pointed to a consistent pattern in which a higher degree of organization of stroke care was associated with lower rates of death, disability, and institutionalization of patients
 - o The overall summary of all 31 trials showed an odds ratio for death of 0.82 (95% confidence interval, 0.73 to 0.92) in favor of more organized inpatient stroke care
 - o Similar odds ratios in favor of more organized care were found for the combined outcome of death/institutional care (OR=0.81) and for death/dependency (OR=0.79); the latter results were not changed when the authors restricted the analysis to trials which were clearly blinded (OR=0.75)
 - o There were 3 trials which had extended follow-up of five years and 2 trials with follow-up of 10 years; the odds ratios for death and for death combined with institutional care or disability were similar to those in the analysis of the short term outcomes
- Additional comparisons between various care models were consistent in favoring higher levels of organized inpatient stroke care
- Subgroup analyses showed no evidence that the effectiveness of organized stroke care was dependent upon age, sex, or stroke severity

Authors’ conclusions:

- Stroke patients are more likely to survive, return home, and be independent on activities of daily living if they receive organized inpatient stroke care than with lesser organized models of care delivery
- This typically means that care is provided by a coordinated multidisciplinary team operating within a dedicated stroke-care ward
- Stroke units should attempt to replicate the organized multidisciplinary care models which were shown to be effective in the included trials
- The additional costs of these units appear to be sufficiently large to justify the reorganization of stroke care services

Comments:

- Even though the authors did not attempt to score the studies for quality, they performed analyses which removed studies in which the risk of bias was unclear; this is more relevant than quality scoring and illustrates the robustness of the results of the analyses
- Even though the 95% confidence intervals for most of the odds ratios for the individual studies (e.g., in Analysis 1.1, 1.2, and 1.3) cross the line for the null value, almost all effect sizes are in favor of organized stroke care, and the number of combined studies justifies a conclusion that there is strong evidence in favor of dedicated stroke care models
- The effect sizes are presented in terms of odds ratios, which may somewhat inflate the apparent effect when the outcome of interest occurs more than about 10% of the time
- Thus, while Analysis 1.3 on page 43 estimates an odds ratio for death or dependency of 0.83 at the end of follow-up, the actual risk reduction is less than the 17% that the odds ratio would appear to show; the actual risk ratio is 0.92, or a more moderate risk reduction closer to 8%, using Cochrane RevMan software:



Assessment: High quality for good evidence that stroke care models which deliver inpatient care in specialized stroke care units lead to modestly lower rates of death, disability, and need for institutional care